

**TRANSLATION**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>P36023-P0</b>	<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
International application No. <b>PCT/JP2004/016938</b>	International filing date ( <i>day/month/year</i> ) <b>15.11.2004</b>	Priority date ( <i>day/month/year</i> ) <b>28.11.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>H03D7/00 , H03D7/12, H03D7/14, H04B1/26</b>		
Applicant <b>MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising: a. <input type="checkbox"/> ( <i>sent to the applicant and to the International Bureau</i> ) a total of _____ sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> ( <i>sent to the International Bureau only</i> ) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input checked="" type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/016938

## Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ the translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rule 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on (
- replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*
- ):

- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:
- nos. \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- sheets \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

- 3.
- ☐
- The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

- 4.
- ☐
- This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/016938

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1.	Statement		
	Novelty (N)	Claims <u>2, 4, 5-8, 10, 11, 13, 15-16</u>	YES
		Claims <u>1, 3, 9, 12, 14</u>	NO
	Inventive step (IS)	Claims <u>8, 13</u>	YES
		Claims <u>1-7, 9-12, 14-16</u>	NO
	Industrial applicability (IA)	Claims <u>1-16</u>	YES
		Claims _____	NO
2.	Citations and explanations (Rule 70.7)		
	<p>Document 1: JP 04-129407 A (Alps Electric Co., Ltd.), 30 April 1992</p> <p>Document 2: JP 07-254821 A (NEC Corp.), 03 October 1995</p> <p>Document 3: JP 2001-522566 A (Maxim Integrated Products, Inc.), 13 November 2001</p> <p>Document 4: JP 09-069730 A (NEC Corp.), 11 March 1997</p> <p>The inventions set forth in claims 1, 3, 9 and 12 are the same as the configurations illustrated in fig. 1 to 3 of document 1 cited in the international search report. In addition, the invention set forth in claim 14 is the same as the configuration illustrated in fig. 2 of document 1 cited in the international search report.</p> <p>Such being the case, the inventions set forth in claims 1, 3, 9, 12 and 14 lack novelty and do not involve an inventive step in the light of document 1 cited in the international search report.</p> <p>Document 1 cited in the international search report indicates that "in order to improve the distortion characteristics, it is necessary to supply a large collector current to the differential amplifier comprising transistors Q5 and Q6; on the other hand, in order to improve the noise factor characteristics of the</p>		

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/016938

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
	<p>double balanced mixer comprising transistors Q1, Q2, Q3 and Q4, it is necessary to decrease the collector current" (refer to page 2, lower left column, lines 4 to 9).</p> <p>Meanwhile, document 2 cited in the international search report discloses a configuration wherein the transistors are connected in parallel in order to reduce the current that flows therethrough.</p> <p>Such being the case, the inventions set forth in claims 2, 10 and 11 are obvious in the light of documents 1 and 2 cited in the international search report; consequently, the inventions in question do not involve an inventive step.</p> <p>Document 3 cited in the international search report describes the technical concept of providing bias current supply circuits, each of which only supplies an additional bias current to a respective output load unit, instead of using a single bias current supply circuit to supply a bias current to all of the output load units.</p> <p>Such being the case, the invention set forth in claim 4 is obvious in the light of documents 1 and 3 cited in the international search report; consequently, the invention in question does not involve an inventive step.</p> <p>Document 4 cited in the international search report disclosed a double balanced mixer circuit (fig. 1) and a single balanced mixer circuit (fig. 2). Given the similar configurations of the mixer circuits in question, it would have been obvious to a person skilled in the art to configure a single balanced mixer circuit from the mixer circuit illustrated in fig. 1 to 3 of document 1 cited in the international search report.</p>

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/016938

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
	<p>Such being the case, the inventions set forth in claims 5 and 7 are obvious in the light of documents 1 and 4 cited in the international search report; consequently, the inventions in question do not involve an inventive step.</p> <p>The configuration that involves a single balanced type mixer circuit is obvious for the same reasons as the inventions set forth in claims 5 and 7, while the configuration wherein the transistors are connected in parallel is obvious for the same reasons as the inventions set forth in claims 2, 10 and 11.</p> <p>Such being the case, the invention set forth in claim 6 is obvious in the light of documents 1, 2 and 4 cited in the international search report; consequently, the invention in question does not involve an inventive step.</p> <p>The provision of current sources, each of which only supplies an additional current to a respective load resistor, is not disclosed or suggested in any of the documents that are cited in the international search report.</p> <p>Consequently, the inventions set forth in claims 8 and 13 involve an inventive step.</p> <p>The substitution of a MOS transistor for a bipolar transistor would be an obvious substitution for a person skilled in the art to make.</p> <p>Such being the case, the invention set forth in claim 15 is obvious in the light of document 1 cited in the international search report; consequently, the invention in question does not involve an inventive step.</p> <p>The configuration wherein the mixer circuit is employed in a direct conversion receiver system or in a</p>

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/016938

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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low-IF receiver system would be obvious to a person skilled in the art.

Such being the case, the invention set forth in claim 16 is obvious in the light of document 1 cited in the international search report; consequently, the invention in question does not involve an inventive step.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/016938

Box No. VI

Certain documents cited

## 1. Certain published documents (Rule 70.10)

Application No. Patent No.	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
<b>JP 2004-104515 A</b>	<b>02.04.2004</b>	<b>10.09.2002</b>	
<b>[P, X]</b>			

## 2. Non-written disclosures (Rule 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day/month/year)	Date of written disclosure referring to non-written disclosure (day/month/year)
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